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CASE BS/1-23369/CLA 1/PCT

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE PCT NATIONAL STAGE APPLICATION OF

Group Art Unit: **1796**

JAN MALIK ET AL.

Examiner: **Tae H. Yoon**

INTERNATIONAL APPLICATION NO. PCT/EP IB 97/00770

Confirmation No. **5113**

FILED: **June 24, 1997**

FOR: STABILIZER COMPOSITIONS

U.S. APPLICATION NO: **09/868,871**

35 USC 371 DATE: June 5, 2001

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

SUPPLEMENTAL APPEAL BRIEF

Sir:

This Supplemental Appeal Brief is in response to the Notice of Non-Compliant Brief dated June 16, 2008. The Notice set a 1 month shortened statutory period for response, making this paper due July 16, 2008. This reply is timely filed and no petition for an extension of time is required.

The Commissioner is hereby authorized to charge any necessary fee or credit any overpayment to Deposit Account No. 03-1935.

This Appeal is from the Final Rejection of claims 1-7, 9, 12, 13, 15 and 17 of the Office Action dated December 4, 2007.

**(1) Real Party of Interest**

The real party of interest, by virtue of an assignment recorded in the U.S. Patent and Trademark Office on September 12, 2006, reel/frame 016963/0954, is:

Ciba Specialty Chemicals Corp.

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Tarrytown, New York 10591

**(2) Related Appeals and Interferences**

To the knowledge of the undersigned, there are no related appeals or interferences.

**(3) Status of the Claims**

Claims 1-7, 9, 12, 13, 15 and 17 are pending and are under consideration.

Claims 8, 10, 11, 14 and 16 are canceled.

Claims 1-7, 9, 12, 13, 15 and 17 are rejected and are presented for appeal.

Claims 1-7, 9, 12, 13, 15 and 17 are present in an attached appendix with status identifiers.

Claims 1, 6 and 9 are independent.

**(4) Status of the Amendments**

The Amendment filed November 1, 2007 brings up to date the status of the claims.

In the Amendment, claim 15 was amended.

## **(5) Summary of the Claimed Subject Matter**

**Claim 1** is aimed at a stabilized polyethylene-based thermoplastic polymer article. The thermoplastic comprises high density polyethylene, low density polyethylene, linear low density polyethylene, ultra low density polyethylene or ultra high molecular weight polyethylene and incorporated therein

- a) at least one sterically hindered phenol,
- b) at least one phosphorus-containing secondary antioxidant, and
- c) at least one tocopherol compound

wherein the weight ratio of component (a) to component (b) is from 2:1 to 1:4 and the weight ratio of component (a) to component (c) is from 2:1 to 10:1.

Support is found in the specification, page 2, third paragraph. Support is also found in the paragraph bridging pages 3 and 4. Support is also found in the second full paragraph of page 5.

**Claim 2**, dependent on claim 1, requires that the weight ratio of (a) to (b) is 1:1 and the weight ratio of (a) to (c) is 5:1. Support is found on page 2, fourth paragraph of the specification.

**Claim 3**, dependent on claim 1, requires the tocopherol to be  $\alpha$ -tocopherol. Support is found in the last full paragraph of page 2.

**Claim 4**, dependent on claim 1, requires the sterically hindered phenol to be within a specified list. Support is found in the specification, paragraph bridging pages 2 and 3. The first hindered phenol of the specification is re-named tetrakis[methylene-3-(3',5')-di-tert-butyl-4'-hydroxyphenyl]propionate]methane in the claim. This more common name is found on the bottom of page 5 of the specification. The list is tetrakis[methylene-3-(3',5')-di-tert-butyl-4'-hydroxyphenyl]propionate; Octadecyl-3,5- bis(1,1-dimethylethyl)-4-hydroxybenzenepropanoate; 1,3,5-tris[[3,5-bis(1,1-dimethylethyl)-4-hydroxyphenyl]methyl]1,3,5,-triazine-2,4,6(1H,3H,5H)trione; 4,4',4"- [2,4,6-trimethyl-1 ,3,5-benzenetriyl)tris-(methylene)tris[2,6-bis(1,1-dimethylethyl)-phenol; Ethanediyl-3,5-bis(1,1-dimethylethyl)-4-hydroxy-thiodi-2,1-

benzenepropanoate; 2:1 calcium salt of monoethyl-[[3,5-bis(1,1-dimethylethyl)-4-hydroxyphenyl]-methyl]-phosphonic acid ester; 2-[3-[3,5-bis(1,1-dimethylethyl)-4-hydroxy-phenyl]-1-oxopropyl]-hydrazide-3,5-bis(1,1 -dimethylethyl)-4-hydroxy-benzene-propanoic acid; 2,2'-oxamido- bis-[ethyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate] or mixtures thereof.

**Claim 5**, dependent on claim 1, requires the phosphorus-containing antioxidants to be within a specified list. Support is found in the full paragraph on page 3 of the disclosure. The list is

Triphenyiphosphite, Tris-isodecyiphosphite;

Tris(nonylphenyl)phosphite; Distearyl pentaerythritol diphosphite; 2,4,6-tri-tert- 5 butylphenyl-2-butyl-2-ethyl-1,3-propanediol phosphite; Bis(2,4-di-tert-butylphenyl)-pentaerythrityl diphosphite; 2,2',2"-nitrilo triethyl-tris[3 ,3 ,5,5 '-tetra-tert-butyl-1,1'- biphenyl-2,2'-diyl]phosphite; Bis[2,4-di-tert-butyl-6-methyl-phenyl]ethyl phosphite; 2,2'- Ethylidene-bis-(4,6-di-tert-butylphenyl)fluorophosphite; Tris(2,4-di-tert-butylphenyl)phosphite; the 4,6-di-tert-butyl-m-cresol condensation products with the Friedel-Crafts-reaction products of biphenyl and phosphorus trichloride; Tetrakis [2,4-di-tert-butylphenyl]-4,4'-biphenylenediphosphonite; or the condensation products of 2,4-di-tertbutylphenol with the Friedel-Crafts-reaction product of biphenyl and  $PCl_3$ .

**Claim 6**, independent, is aimed at a method for enhancing processing stability of high density polyethylene, low density polyethylene, linear low density polyethylene, ultra low density polyethylene or ultra high molecular weight polyethylene,

which method comprises incorporating therein before or during processing a stabilizing quantity of

- a) at least one sterically hindered phenol,
- b) at least one phosphorus-containing secondary antioxidant, and
- c) at least one tocopherol compound

wherein the weight ratio of component (a) to component (b) is from 2:1 to 1:4 and the weight ratio of component (a) to component (c) is from 2:1 to 10:1.

Support is found in the paragraph bridging pages 4 and 5 of the disclosure. Support is also found in the third paragraph of page 2.

**Claim 7**, dependent on claim 6, requires components (a), (b) and (c), in total, to be added in an amount of from 0.001 to 5% by weight, based on the polyethylene. Support is found in the first full paragraph of page 5 of the specification.

**Claim 9**, independent, is aimed at a masterbatch composition comprising 90 to 20% by weight of high density polyethylene, low density polyethylene, linear low density polyethylene, ultra low density polyethylene or ultra high molecular weight polyethylene

and

10 to 80% by weight, in total, of

- a) at least one sterically hindered phenol,
- b) at least one phosphorus-containing secondary antioxidant, and
- c) at least one tocopherol compound

wherein the weight ratio of component (a) to component (b) is from 2:1 to 1:4 and the weight ratio of component (a) to component (c) is from 2:1 to 10:1.

Support is found in the specification, page 4, fourth full paragraph. Support is also found on page 2, third paragraph.

**Claim 12**, dependent on claim 6, requires that components (a), (b) and (c), in total, are incorporated in an amount of from 0.01 to 1% by weight, passed on the polyethylene. Support is found on page 5, first full paragraph.

**Claim 13**, dependent on claim 6, requires that components (a), (b) and (c), in total, are incorporated in an amount of from 0.1 to 0.5% by weight, passed on the polyethylene. Support is found on page 5, first full paragraph.

**Claim 15**, dependent on claim 1, is aimed at a stabilized polyethylene-based thermoplastic polymer article comprising

- a) tetrakis[methylene-3-(3',5')-di-tert-butyl-4'-hydroxyphenyl]propionate]methane,

b) a mixture of

50-80 parts by weight of tetrakis(2,4-di-tert-butylphenyl)-biphenylene-diphosphonite,

10-25 parts by weight of bis(2,4-di-tert-butylphenyl)biphenylene-monophosphonite and

10-25 parts by weight of tris-(2,4-di-tert-butylphenyl)phosphite and

c) is  $\alpha$ -tocopherol,

where the weight ratio of component (a) to component (b) is from 2:1 to 1:1 and the weight ratio of component (a) to component (c) is from 5:1 to 10:1.

Support for component (a) is found on the bottom of page 5 of the disclosure. Support for the three-part mixture of phosphorus containing antioxidants is found in lines 10-16 of page 12. Support for component (c) is found in the last full paragraph of page 2. Support for the weight ranges of components (a) to (b) and (a) to (c) is found on page 2, third and fourth paragraphs.

**Claim 17**, dependent on claim 15, requires the weight ratio of component (a) to component (b) to be 1:1 and the weight ratio of (a) to (c) to be 10:1. Support is found on page 2, third and fourth paragraphs.

## **(6) Grounds of Rejection to be Reviewed on Appeal**

The ground for rejection for review are:

1) Claims 1-7, 12 and 13 are rejected under 35 USC 103(a) as being unpatentable over DE 3903218 in view of Keller, et al., U.S. Pat. No. 5,574,082, JP 62-158737 and Fukui, et al., U.S. Pat. No. 5,100,930 and further in view of Laermer, et al., U.S. Pat. No. 5,308,549.

2) Claims 1-7, 9, 12, 13, 15 and 17 are rejected under 35 USC 103(a) as being unpatentable over DE '218 in view of Keller, JP '737 and Fukui and further in view of Tamura, U.S. Pat. No. 6,096,814 and Laermer, et al., U.S. Pat. No. 5,308,549.

## (7) Argument

1) Claims 1-7, 12 and 13 are rejected under 35 USC 103(a) as being unpatentable over DE 3903218 in view of Keller, et al., U.S. Pat. No. 5,574,082, JP 62-158737 and Fukui, et al., U.S. Pat. No. 5,100,930 and further in view of Laermer, et al., U.S. Pat. No. 5,308,549.

Regarding the first rejection, Appellants assume here that the Examiner also means to reject claims 15 and 17.

The second rejection is relevant to claim 9, aimed at a masterbatch.

Appellants rebut the first rejection as follows.

Keller, JP '737 and Fukui are cited as disclosing the use of sterically hindered phenol, phosphorus-containing antioxidant and  $\alpha$ -tocopherol in polyolefins.

DE '218 is cited as disclosing a sterically hindered phenol, phosphorus-containing antioxidant and  $\alpha$ -tocopherol in Examples 2 and 4 therein and stabilization of polyethylene at page 2, lines 65-66.

Laermer teaches the stabilization of plastics with a mixture of one part tocopherol and 1.4 to 5 parts of a phosphorus-containing secondary antioxidant. Polyethylene is disclosed as a plastic substrate.

The Examiner states that it is obvious to arrive at the present invention from the combined disclosures of these references.

Appellants again reiterate the unexpected results of the second Thürmer Declaration, filed September 25, 2006. Appellants submit that inventive samples 3 and 4 are clearly and unexpectedly superior to prior art samples 1 and 2. Samples 1 and 2 contain the stabilizer mixtures of Examples 3 and 4 of DE '218.

Inventive samples 3 and 4 have a weight ratio of components (a) to (c) of 10:1. Prior art samples 1 and 2 have a weight ratio of components (a) to (c) of 12.5:1 and 25:1.

It is noted that the mixture of 4,4'PQ, MPQ and P68 of DE '218 is equivalent to P-EPQ which is the mixture of phosphorus-containing antioxidants of present claims 15 and 17. See page 12 of the specification.

The inventive samples 3 and 4 are superior in regard to both retention of melt flow and degree of yellowing after multiple pass extrusion. The Declarant, an expert in the field, states so in the Declaration.

The Examiner states that the present claims do not require repeated extrusion processes. Appellants submit that melt flow and degree of yellowing after multiple pass extrusion are well known methods for determining the efficacy of stabilizers. For instance, see Table I of Laermer. Appellants submit that the patentability of the present claims is supported by the results of the Thürmer Declaration. The second paragraph of the present specification states that processing of polymers can have an adverse effect on molecular weight and physical properties. Stabilizers are necessary to minimize oxidation and discoloration.

Appellants note that present claims 15 and 17 are aimed more specifically at the invention as supported by the Thürmer Declaration.

In inventive sample 3, the weight ratio of component (a) to (b) is 1.1:1 and the weight ratio of (a) to (c) is 10:1.

Present claim 17 requires a weight ratio of component (a) to (b) to be 1:1 and a weight ratio of (a) to (c) to be 10:1.

The Examiner states that arriving at the present ratio of 10:1 (claim 17) sterically hindered phenol to  $\alpha$ -tocopherol would be an obvious modification of the disclosure of DE '218. Appellants submit that the surprising results of the Thürmer Declaration are evidence that this is not an obvious modification.

2) Claims 1-7, 9, 12, 13, 15 and 17 are rejected under 35 USC 103(a) as being unpatentable over DE '218 in view of Keller, JP '737 and Fukui and further in view of Tamura, U.S. Pat. No. 6,096,814 and Laermer, et al., U.S. Pat. No. 5,308,549.

Regarding the second rejection:

Tamura is cited as disclosing the stabilization of a polyolefin via the use of a stabilizer masterbatch.

Appellants rebut these rejections by reiterating their arguments above regarding the first rejection.

In view of the present remarks and the Thürmer Declaration, Appellants submit that the 35 USC 103(a) rejections are addressed and are successfully rebutted.

Appellants submit that the claim rejections are in error and respectfully request that they be reversed.

Respectfully submitted,



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Attachments: Claims Appendix

Evidence Appendix

Related Proceedings Appendix

**(8) Claims Appendix** Claims 1-7, 9, 12, 13, 15 and 17

**1. (previously presented)** A thermoplastic polymer article comprising

high density polyethylene, low density polyethylene, linear low density polyethylene, ultra low density polyethylene or ultra high molecular weight polyethylene and

incorporated therein

- a) at least one sterically hindered phenol,
- b) at least one phosphorus-containing secondary antioxidant, and
- c) at least one tocopherol compound

wherein the weight ratio of component (a) to component (b) is from 2:1 to 1:4 and the weight ratio of component (a) to component (c) is from 2:1 to 10:1.

**2. (previously presented)** A polymer article according to claim 1 wherein the weight ratio of component (a) to component (b) is 1:1 and the weight ratio of component (a) to component (c) is 5:1.

**3. (previously presented)** A polymer article according to claim 1 wherein the tocopherol compound is  $\alpha$ -tocopherol (5,7,8-Trimethyl-tocol).

**4. (previously presented)** A polymer article according to claim 1 wherein the sterically hindered phenol is tetrakis[methylene-3-(3',5')-di-tert-butyl-4'-hydroxyphenyl)propionate]methane; Octadecyl-3,5- bis(1,1-dimethylethyl)-4-hydroxybenzenepropanoate; 1,3,5-tris[[3,5-bis(1,1-dimethylethyl)-4-hydroxyphenyl]methyl]1,3,5,-triazine-2,4,6(1H,3H,5H)trione; 4,4',4" - [2,4,6-trimethyl-1 ,3,5-benzenetriyl]tris-(methylene)tris[2,6-bis(1,1-dimethylethyl)-phenol; Ethanediyil-3,5-bis(1,1-dimethylethyl)-4-hydroxy-thiodi-2,1-benzenepropanoate; 2:1 calcium salt of monoethyl-[[3,5-bis(1,1-dimethylethyl)-4-hydroxyphenyl]-methyl]-phosphonic acid ester; 2-[3-[3,5-bis(1,1-dimethylethyl)-4-

hydroxy-phenyl]-1-oxopropyl]- hydrazide-3,5-bis(1,1 -dimethylethyl)-4-hydroxy-benzene-propanoic acid; 2,2'-oxamido- bis-[ethyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate] or mixtures thereof.

**5. (previously presented)** A polymer article according to claim 1 wherein the phosphorus-containing secondary antioxidants are Triphenyiphosphite, Tris-isodecylphosphite; Tris(nonylphenyl)phosphite; Distearyl pentaerythritol diphosphite; 2,4,6-tri-tert- 5 butylphenyl-2-butyl-2-ethyl-1,3-propanediol phosphite; Bis(2,4-di-tert-butylphenyl)-  
pentaerythrityl diphosphite; 2,2',2"-nitrilo triethyl-tris[3 ,3 ,5,5 '-tetra-tert-butyl-1,1'- biphenyl-2,2'-  
diyl]phosphite; Bis[2,4-di-tert-butyl-6-methyl-phenyl]ethyl phosphite; 2,2'- Ethylidene-bis-(4,6-di-tert-  
butylphenyl)fluorophosphite; Tris(2,4-di-tert-butylphenyl)phosphite; the 4,6-di-tert-butyl-m-cresol  
condensation products with the Friedel-Crafts-reaction products of biphenyl and phosphorus  
trichloride; Tetrakis [2,4-di-tert-butylphenyl]-4,4'-biphenylenediphosphonite; or the condensation  
products of 2,4-di-tertbutylphenol with the Friedel-Crafts-reaction product of biphenyl and  $\text{PCl}_3$ .

**6. (previously presented)** A method for enhancing the processing stability of high density polyethylene, low density polyethylene, linear low density polyethylene, ultra low density polyethylene or ultra high molecular weight polyethylene

which method comprises incorporating therein before or during processing a stabilizing quantity of

- a) at least one sterically hindered phenol,
- b) at least one phosphorus-containing secondary antioxidant, and
- c) at least one tocopherol compound

wherein the weight ratio of component (a) to component (b) is from 2:1 to 1:4 and  
the weight ratio of component (a) to component (c) is from 2:1 to 10:1.

**7. (previously presented)** A method according to claim 6 wherein components a), b) and c), in total, are added in an amount of from 0.001 to 5% by weight, based on the polyethylene.

8. (canceled)

9. (previously presented) A masterbatch composition comprising

90 to 20% by weight of high density polyethylene, low density polyethylene, linear low density polyethylene, ultra low density polyethylene or ultra high molecular weight polyethylene

and

10 to 80% by weight, in total, of

- a) at least one sterically hindered phenol,
- b) at least one phosphorus-containing secondary antioxidant, and
- c) at least one tocopherol compound

wherein the weight ratio of component (a) to component (b) is from 2:1 to 1:4 and the weight ratio of component (a) to component (c) is from 2:1 to 10:1.

10. (canceled)

11. (canceled)

12. (previously presented) A method according to claim 6 wherein components a), b) and c), in total, are incorporated in an amount of from 0.01 to 1% by weight, based on the polyethylene.

13. (previously presented) A method according to claim 6 wherein components a), b), and c), in total, are incorporated in an amount of from 0.1 to 0.5% by weight, based on the polyethylene.

14. (canceled)

15. (previously presented) A polymer article according to claim 1 wherein

component a) is tetrakis[methylene-3-(3',5')-di-tert-butyl-4'-hydroxyphenyl)propionate]methane,

component b) is a mixture of

50-80 parts by weight of tetrakis(2,4-di-tert-butylphenyl)-biphenylene-diphosphonite,

10-25 parts by weight of bis(2,4-di-tert-butylphenyl)biphenylene-monophosphonite and

10-25 parts by weight of tris-(2,4-di-tert-butylphenyl)phosphite and

component c) is  $\alpha$ -tocopherol,

where the weight ratio of component (a) to component (b) is from 2:1 to 1:1 and the weight ratio of component (a) to component (c) is from 5:1 to 10:1.

16. (canceled)

17. (previously presented) A polymer article according to claim 15

where the weight ratio of component (a) to component (b) is 1:1 and the weight ratio of component (a) to component (c) is 10:1.

**(9) Evidence Appendix**

The second Thürmer Declaration, filed September 25, 2006, is submitted as evidence. The Declaration is present in the case file.

**(10) Related Proceedings Appendix**

To the knowledge of the undersigned, there are no related appeals or interferences, and thus, no related court or Board decisions.